CT-10G-MC series Media Converter User's Manual

CT-10G-MC Ver 1.1

Revision History

Date	Version	History
2011/05/06	1.0	First draft version
2011/08/01	1.1	Add XFP2 version

Table of Contents

Foreword 2
Revision History 3
1. CT-10G-MC series Overview 6
1.1. General Descriptions of CT-10G-MC 6
1.2. Features, Key Advantages, and Main Applications of CT-10G-MC series 7
1.3. CT-10G-MC series Functions Overview 8
1.3.1. CT-10G-MC series Outer Case 8
1.3.2. CT-10G-MC series Front Panel 9
A. Front Panel of CT-10G-MC-SFP+2 series 9
B. Front Panel of CT-10G-MC-XSFP+ series 10
C. Front Panel of CT-10G-MC-SFP+ series 11
D. Front Panel of CT-10G-MC-CX4 series 12
E. Front Panel of CT-10G-MC-XFP2 series 13
F. Front Panel of CT-10G-MC-XFP series 14
1.3.3. CT-10G-MC series Back Panel 15
2. CT-10G-MC series Installation 16
2.1. Choices of UTP Cable and Optical fiber 16
2.1.1. 10GBASE-T (Copper Wire) 16
2.1.2. 10GBASE-R (Optical Fiber) 17
2.2. Connection of UTP Cable and Optical fiber 18
2.2.1. 10GBASE-T (Copper Wire) 18
2.2.2. 10GBASE-R (Optical Fiber) 18
2.3. Applications Examples for Your Network 20
2.3.1. Application for University 20
2.3.2. Application for Online Game Company 21
2.3.3. Application for Home Users 22
3. CT-10G-MC series Management 23
3.1. Managing CT-10G-MC series with Management Webpage 23
3.1.1. Accessing CT-10G-MC series Management Webpage 24
3.1.2. CT-10G-MC series Management Webpage – Overview 25
3.1.3. CT-10G-MC series Management Webpage – System 26
A. System Information 26
3.1.3. CT-10G-MC series Management Webpage – Management 27
A. IP Configuration 27
B. User Settings 28
C. System Configuration 28
D. SNMP Setting 29
3.1.4. CT-10G-MC series Management Webpage – Counter 29
A. Device Counter 29
3.1.5. CT-10G-MC series Management Webpage – Maintenance 30
A. Save Changes 30
B. Update F/W (Firmware) 30
C Update FPGA 30
D. System Reboot 31
E. System Config 31
F. Config Upload 31
G. Factory Defaults 31
3.2. Managing CT-10G-MC series with HyperTerminal 32
3.3.1. HyperTerminal Settings for CT-10G-MC series 32
3.3.2. CT-10G-MC series HyperTerminal Commands 35
A. CT-10G-MC series HyperTerminal Command – system 36
B. CT-10G-MC series HyperTerminal Command – counter 38
C. CT-10G-MC series HyperTerminal Command – ip 38
D. CT-10G-MC series HyperTerminal Command – cls 39

E. CT-10G-MC series HyperTerminal Command – logout.....39
4. CT-10G-MC series General Specifications.....40

1. CT-10G-MC series Overview

1.1. General Descriptions of CT-10G-MC

CT-10G-MC series is a complete and versatile solution for applications such as FTTx, CWDM, and carrier Ethernet. By the diversified speeds of 10Gbps, our provides standalone CT-10G-MC series for different applications and can be applied according to your ideal network topology.

Our CT-10G-MC series provides various interfaces such as 10GUTP, SFP+, XFP and CX4. All these interfaces are developed to support the protocols such as 10GBase-T, 10GBase-EZR, 10GBase-ZR, 10GBase-ER, 10GBase-LR, 10GBase-SR and 10GBase-CX4, thus making your network more complete and solid.

All CT-10G-MC series are equipped with real-time LEDs which display the status of each port, thus allowing users to view network status easily.

CT-10G-MC series provides an easy-to-access Management Webpage, allowing users to view system status, counters, and network statistics.

Also, CT-10G-MC series supports MIB Counter Report including counters such as Packet, Byte, Broadcast packet, Pause Frame, Length: 64 Bytes, Length: 65-127 Bytes, Length: 128-255 Bytes, Length: 256-511 Bytes, Length: 512-1023 Bytes, Length: 1024-1518 Bytes, Unicast packet, Multicast packet, CRC Error, IP Checksum Error , Under size packet, and Over size packet.

With various interfaces, CT-10G-MC series provides different conversions between fibers and copper wires in 10Gbps Ethernet.

1.2. Features, Key Advantages, and Main Applications of CT-10G-MC series

Features

- Diversified interfaces including SFP+, RJ45, XFP and CX4
- Supports 3R (Re-generation, Re-timing, Re-shaping) Performance, both in STM-64 & OC-192
- Supports Jumbo Frame
- Supports DDI (Digital Detection) functioned optical transceivers and overload protection
- Support easy-to-use Management Webpage that allows users to view system status, counters, and network statistics
- Supports SNMP (Simple Network Management Protocol)
- Supports Link Loss Forwarding

Key Advantages

- Fast connection with multi-function
- Provide reliable long-distance connection
- Port supported: SFP+, RJ45, XFP and CX4
- Small portable size case
- Plug and play without extra configuration

Main Applications

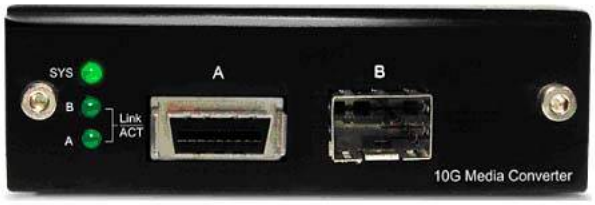
- Media converter for network backbone
- Connection between fiber to copper or fiber to fiber 10Gbps Ethernet equipment
- Can be applied in Telecommunication room, R&D laboratory, Data center, and etc.

1.3. CT-10G-MC series Functions Overview

1.3.1. CT-10G-MC series Outer Case

CL-MC-CX4 back panel

Cool Fan



CT-10G-MC-CX4 Front panel

CT-10G-MC series' outer case consists three parts: Front Panel, Cooling Fan, and Back Panel. The figure above shows the outer case of CT-10G-MC-CX4 series. Outer cases of other CT-10G-MC series are quite the same and can be related.

CT-10G-MC series Outer Case Overview	
Front Panel	CT-10G-MC series comes with various different types of ports, providing media converting platforms for different types of media. Please see "**1.3.2. CT-10G-MC series Front Panel**" for more detailed information.
Cooling Fan	Cooling fan for ventilation. All CT-10G-MC series have cooling fans installed.
Back Panel	CT-10G-MC series' back panels allow users to access their management web pages or making configurations via hyper terminal softwares. Also, CT-10G-MC series' power jack is located on the back panel as well. Please see "**1.3.3. CT-10G-MC series Back Panel**" for more detailed information.

1.3.2. CT-10G-MC series Front Panel

As mentioned in "**1.3.1. CT-10G-MC series Outer Case**", CT-10G-MC series comes with various different types of ports, providing media converting platforms for different types of media. Please see the sections down below for more detailed information/specification for CT-10G-MC series.

A. CT-10G-MC-1 series

CT-10G-MC-1 series Front Panel Specification		
Interface	**Port A**	SFP+
	Port B	SFP+
Data Transfer Rate		10Gbps
Ethernet Mode		10GBase-LR 10GBase-SR
LED Status		
Power	**Green ON**	CT-10G-MC-1 series is power on.
	Green OFF	CT-10G-MC-1 series is power off.
SYS	**Green ON**	CT-10G-MC-1 series is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting CT-10G-MC-1 series.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	

B. CT-10G-MC-2 series

CT-10G-MC-2 series Front Panel Specification		
Interface	**Port A**	SFP+
	Port B	XFP
Data Transfer Rate		10Gbps
Ethernet Mode		10GBase-LR 10GBase-SR
LED Status		
Power	**Green ON**	CT-10G-MC-2 series is power on.
	Green OFF	CT-10G-MC-2 series is power off.
SYS	**Green ON**	CT-10G-MC-2 series is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting CT-10G-MC-2 series.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	

C. CT-10G-MC-3 series

CT-10G-MC-3 series Front Panel Specification		
Interface	**Port A**	RJ45
	Port B	SFP+
Data Transfer Rate		10Gbps
Ethernet Mode		10GBase-LR 10GBase-SR 10GBase-T

LED Status		
Power	**Green ON**	CT-10G-MC-3 series is power on.
	Green OFF	CT-10G-MC-3 series is power off.
SYS	**Green ON**	CT-10G-MC-3 series is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting CT-10G-MC-3 series.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	

D. CT-10G-MC-4 series

CT-10G-MC-4 series Front Panel Specification		
Interface	**Port A**	CX4
	Port B	SFP+
Data Transfer Rate		10Gbps
Ethernet Mode		10GBase-LR 10GBase-SR 10GBase-CX4
LED Status		
SYS	**Green ON**	CT-10G-MC-4 series is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting CT-10G-MC-4 series.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.

E. CT-10G-MC-5 series

CT-10G-MC-5 series Front Panel Specification		
Interface	**Port A**	XFP
	Port B	XFP
Data Transfer Rate		10Gbps
Ethernet Mode		10GBase-LR 10GBase-SR

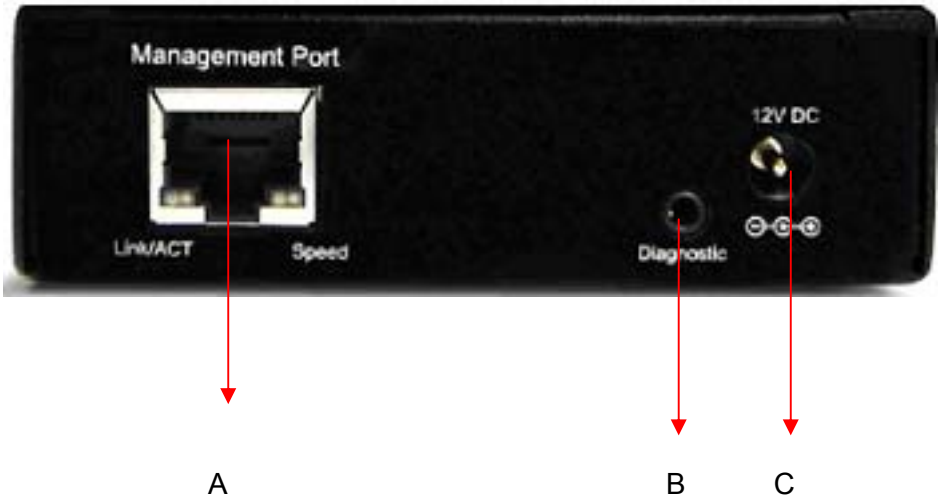
LED Status		
Power	**Green ON**	CT-10G-MC-5 series is power on.
	Green OFF	CT-10G-MC-5 series is power off.
SYS	**Green ON**	CT-10G-MC-5 series is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting CT-10G-MC-5 series.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	

F. CT-10G-MC-6 series

CT-10G-MC-6 series Front Panel Specification		
Interface	**Port A**	RJ45
	Port B	XFP
Data Transfer Rate		10 Gbps
Ethernet Mode		1000Base-T 10GBase-LR 10GBase-SR

LED Status		
Power	**Green ON**	CT-10G-MC-6 series is power on.
	Green OFF	CT-10G-MC-6 series is power off.
SYS	**Green ON**	CT-10G-MC-6 series is booting properly and is ready for tests.
	Yellow ON	Error occurred when booting CT-10G-MC-6 series.
A/B	**Green ON**	Port A/B is connected.
	Green Blinking	Port A/B is transmitting/receiving data.
■	User-defined LED	
▲	User-defined LED	

1.3.3. CT-10G-MC series Back Panel



CT-10G-MC series Back Panel Description		
A	**Management Port**	100 Mbps RJ45 Management Port for connecting CT-10G-MC series to a network, thus allowing users to access CT-10G-MC series' management web pages
B	**Diagnostic Port**	2.5mm Phone Jack for connecting PC's RS 232 port, thus allowing users to make configurations via hyper terminal softwares.
C	**Power Jack**	DC 12 V Power Jack

2. CT-10G-MC series Installation

As a media convertor platform, installing CT-10G-MC series is very easy and simple: all you have to do is to plug the proper fiber/UTP cables into CT-10G-MC series' ports like a general Ethernet switch without any extra configurations. However, selecting the proper physical media and applications in your network environment is crucial when installing CT-10G-MC series. Please see the sections down below for detailed information regarding to physical media types and CT-10G-MC series application.

2.1. Choices of UTP Cable and Optical fiber

2.1.1. 10GBASE-T (Copper Wire)

10GBASE-T, or IEEE 802.3an-2006, is a standard released in 2006 to provide 10 gigabit/second connections over unshielded or shielded twisted pair cables and over distances up to 100 meters (330 ft). 10GBASE-T cable infrastructure can also be used for 1000BASE-T, allowing a gradual upgrade from 1000BASE-T, and auto-negotiation to select which speed to use.

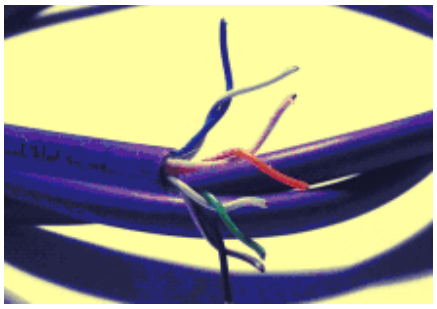
10GBASE-T Connectors

10GBASE-T uses 650 MHz versions of the venerable IEC 60603-7 8P8C (RJ-45) connectors, which is already widely used in Ethernet.

10GBASE-T Cables

10GBASE-T works up to 55 m (180 ft) with existing Category 6 cabling. In order to allow deployment at the usual 100 m (330 ft), the standard uses a new partitioned Category 6a cable specification, designed to reduce crosstalk between UTP cables.

The table down below is a reference regarding to UTP cable categories.

UTP Cable Categories References	
Cat 5	Provides performance of up to 100 MHz, and was frequently used on 100 Mbps Ethernet networks. Cat 5 may not be suitable for 1000BASE-T gigabit Ethernet.
Cat 5e	Provides performance of up to 100 MHz, and is frequently used for both 100 Mbps and Gigabit Ethernet networks.
Cat 6	Provides performance of up to 250 MHz, more than double of category 5 and 5e. It works up to 55 m (180 ft) for 10Gbps Ethernet.
Cat 6a	Provides performance of up to 500 MHz. It is suitable for 10GBASE-T and works up to 100 m (330 ft) for 10Gbps Ethernet. All the cables mentioned above do not have individually- shielded pairs as the picture here, including Cat 6a. 
Cat 7	This standard specifies four individually-shielded pairs (STP) inside an overall shield. Designed for transmission at frequencies up to 600 MHz. It has better performance than Cat 6a.

2.1.2. 10GBASE-R (Optical Fiber)

10GBASE-R is 10Gbps Ethernet connection that based on IEEE802.3ae. It uses fiber as transmission media with different specification of fiber, connector and transceiver. CT-10G-MC series uses two standards, 10GBASE-LR and 10GBASE-SR.

10GBASE-SR

10GBASE-SR ("Short Range") uses 64B/66B encoding and 850 nm wavelength lasers. It is designed to support short distances over deployed multi-mode fiber cabling, it has a range of between 26 meters (85 ft) and 82 meters (270 ft) depending on cable type. It also supports 300 meters (980 ft) operation over new, 50 μm 2000 MHz·km OM3 multi-mode fiber (MMF).

The transmitter can be implemented with a VCSEL (Vertical Cavity Surface Emitting Laser) which is low cost and low power. MMF has the advantage of having lower cost connectors than SMF (single-mode fiber) due to its wider core.

10GBASE-SR delivers the lowest cost, lowest power and smallest form factor optical modules.

10GBASE-LR

10GBASE-LR ("Long Range") is a Long Range Optical technology delivering serialized 10 gigabit Ethernet over a laser with 1310 nm wavelength connection on single-mode fiber via IEEE 802.3 Clause 49 64B-66B Physical Coding Sub layer (PCS) using a line rate of 10.3125.

Single-mode optical cabling is used to interconnect transceivers at a distance spaced at 10 kilometers (6.2 mi), but it can often reach distances of up to 25 kilometers (16 mi) with no data loss.

Fabry–Pérot lasers are commonly used in 10GBASE-LR optical modules. Fabry–Pérot lasers are more expensive than VCSELs (mentioned above) but their high power and focused beam allow efficient coupling into the small core of single mode fiber.

Fiber Specification

Fibers which support many propagation paths or transverse modes are called multi-mode fibers (MMF). Fibers which can only support a single mode are called single-mode fibers (SMF). Multi-mode fibers generally have a larger core diameter, and are used for short-distance communication links and for applications where high power must be transmitted. Single-mode fibers are used for most communication links longer than 200 meters.

Fiber Buffer/Jacket Color	Meaning
Yellow	Single-mode optical fiber, long distance connection
Orange	Multi-mode optical fiber, short distance connection

2.2. Connection of UTP Cable and Optical fiber

2.2.1. 10GBASE-T (Copper Wire)

10GBASE-T uses the same RJ45 connector that is the same as original 100M/1000Mbps Ethernet network. Just plugging the RJ45 connector into the port of 10Gbps and it is ready to work. When connected properly, the Link/ACT LED located under the RJ45 Port will be on accordingly. 10G UTP need apply Cat6a or Cat7 cable.

2.2.2. 10GBASE-R (Optical Fiber)

Please see the figure down below for connecting the optical fiber, transceiver, and CT-10G-MC series' SFP+ Port.

PLUG SFP+ transceiver into 10G Media converter

Optical Fiber

As mentioned above, there are Single-mode and Multi-mode optical fiber. Both of them can be used for CT-10G-MC series .

Fiber Connector

Optical fiber connector contains two ends of fibers and can attach to SFP+ transceivers. There are two ports for one SFP+ transceiver: one fiber is for receiving and one fiber is for transmitting. The picture here is called LC connector that can attach to SFP+ transceiver.

Transceiver (Connector)

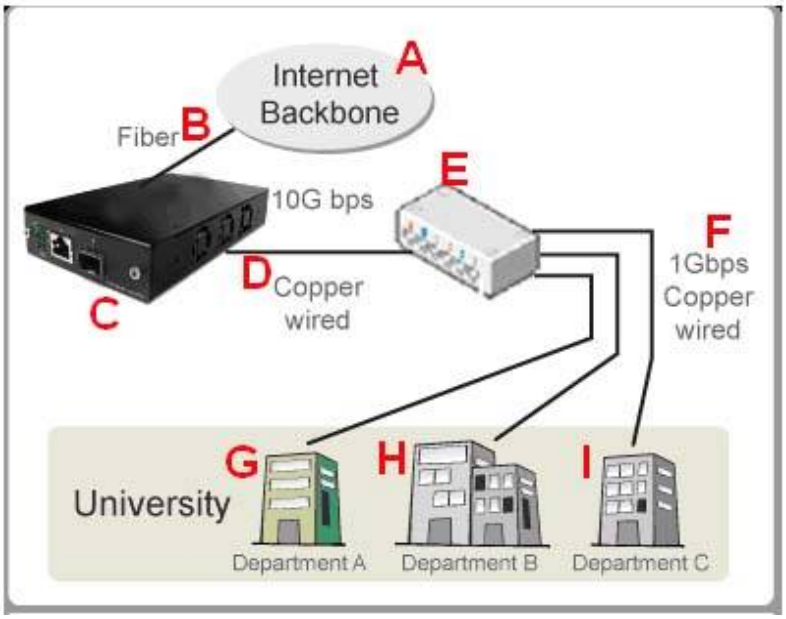
SFP+/XFP Transceivers can be plugged into CT-10G-MC series' SFP+/XFP Ports. SFP+/XFP Transceivers are active components that consume power from CT-10G-MC series and are capable of converting signals between optical data flow and electronic data flow.

For different transmission purpose, the component inside SFP+ form factor can be 10BASE-SR, LR, ER, ZR, EZR, mode.

2.3. Applications Examples for Your Network

2.3.1. Application for University

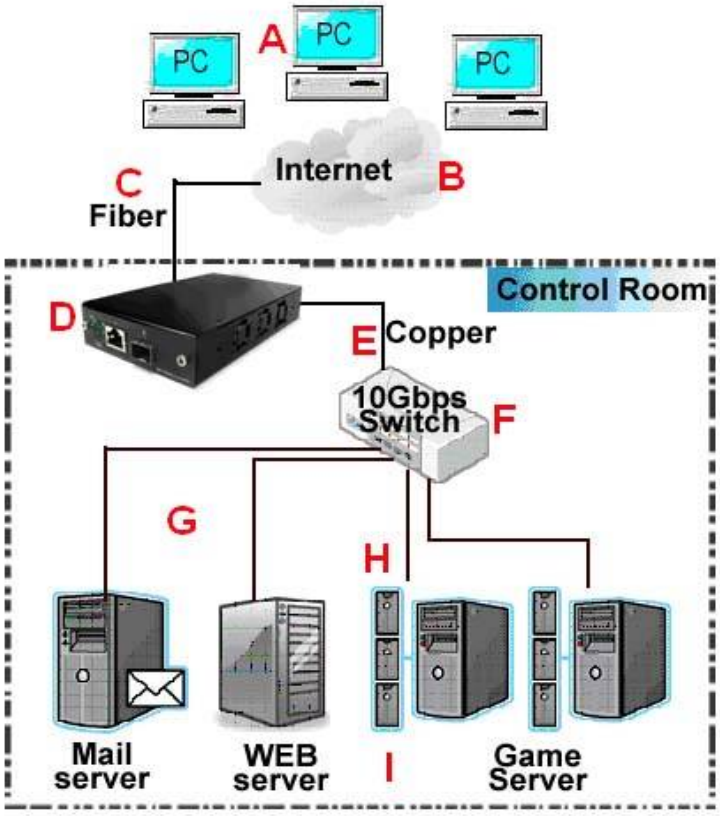
10Gbps speed Ethernet connection may not be commonly seen in ordinary offices. However, network administrators may have Gigabit Ethernet in their control rooms already. Getting 10Gbps Ethernet connection from Internet Backbone and distributing it to different Gigabit Ethernet segment for different buildings or organizations is practical and more cost-effective. Figure down below is an example of a possible network structure for a university:



Descriptions	
A	Internet backbone from ISP.
B	The distance from the central office to the university might be long, and it is advised to construct the connection via single-mode optical fiber with 10BASE-LR mode, which can extend the distance beyond tens of kilometers.
C	CT-10G-MC series, which is located at the computer center of university.
D	After the conversions made by CT-10G-MC series, expensive equipments for transmitting/receiving network data via optical fiber are not required anymore.
E	Full 10Gbps Ethernet switches may be exceeding your budget or not available. Some 1Gbps switches reserve a swappable slot for future upgrading. You can purchase a 10Gbps module with one 10Gbps port for these switches to serve the same purpose.
F	Several 1Gbps connections can be distributed by the switches mentioned above to different buildings inside the university by Cat 6a network cables (which can be extended to 100 meters).
G/H/I	General switches with 1Gbps or 100Mbps ports can be connected here for the end-users.

2.3.2. Application for Online Game Company

For ISPs or online game companies, CT-10G-MC series provide a more economical solution for control room cabling. ISP runs lots of customer's service such as e-mail servers, web servers or any co-located network services in the control rooms. These equipments may not have the interface for the connection of optical fibers. For online game company, administrators may have lots of online game servers that need high-speed connections to Internet backbone in the control rooms as well.

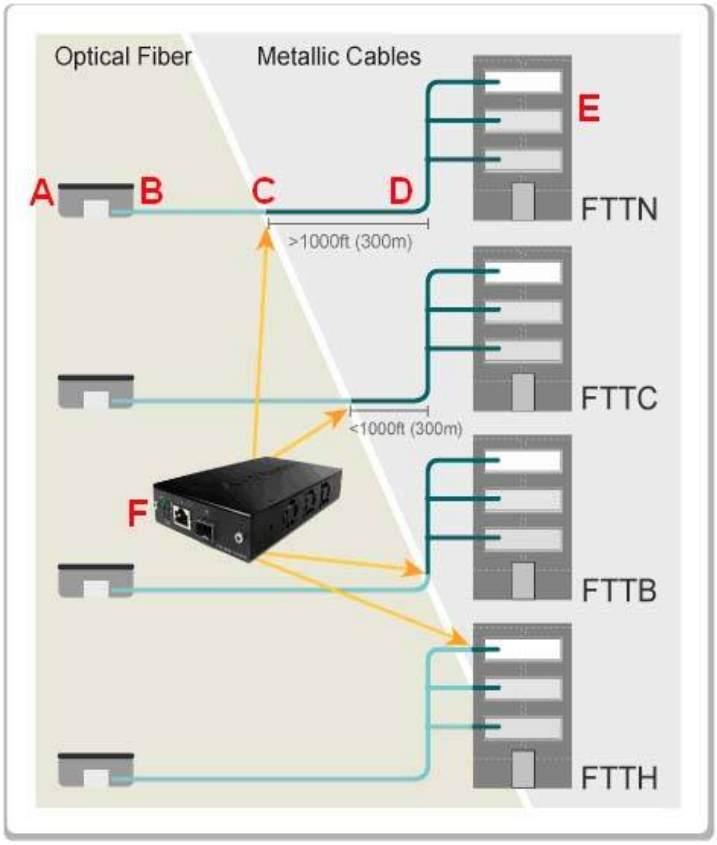


Descriptions	
A	Internet client users
B	Mass requests of the general public, coming from other ISPs through Internet.
C	The distance from other ISPs to the game company might be long, and it is advised to construct the connection via single-mode optical fiber with 10BASE-LR mode, which can extend the distance beyond tens of kilometers.
D	CT-10G-MC series, which is located at the control room of the game company.
E	After the conversions made by CT-10G-MC series, expensive equipments for transmitting/receiving network data via optical fiber are not required anymore.
F	Depending on the network loading requirements, Ethernet Switch with full 10Gbps ports or partial 10Gbps/1Gbps ports should be configured for data flow distributions.
G	If that the bandwidth requirement of co-located mail servers for some companies is not heavy, you can connect them to 1Gbps port of 10Gbps switch as shown in the figure above.
H	If the bandwidth requirement of online game servers is heavy, you can connect them to 10Gbps port of 10Gbps switch as shown in the figure above.
I	Different kinds of server with different applications are located side by side by connections from 10Gbps Ethernet Switch via inexpensive Cat.6 cable.

2.3.3. Application for Home Users

The figure down below is an example of how the FTTX architectures may vary regarding to distances between the optical fiber and the end-users. Fiber to the x (FTTX) is a generic term for any network architecture that uses optical fiber to replace all or part of the usual copper local loop used for telecommunications. These four Technology are listed down below:

- Fiber to the node / neighborhood (FTTN)
- Fiber to the curb (FTTC) / Fiber to the kerb (FTTK)
- Fiber to the building (FTTB)
- Fiber to the home (FTTH)



The building on the left is the central office. The building on the right is one of the buildings served by the central office. The white or gray blocks represent separate rooms or office spaces within the same building.

Descriptions	
A	ISP Central Office
B	Network connection via optical fiber
C	Installation of CT-10G-MC series for media conversion
D	Network connection via copper wire. It can be Cat 6a cable (under 300 meters) or telephone line via xDSL (Technology such as VDSL provide high speed, short-range link are used often in FTTx service)
E	Different rooms of homes or different compartments in the same building.
F	CT-10G-MC series can be located at any place that near or away from building, depending on the service to home users.

3. CT-10G-MC series Management

You can configure CT-10G-MC series' settings and view statistics generated while performing media converting with CT-10G-MC series by:

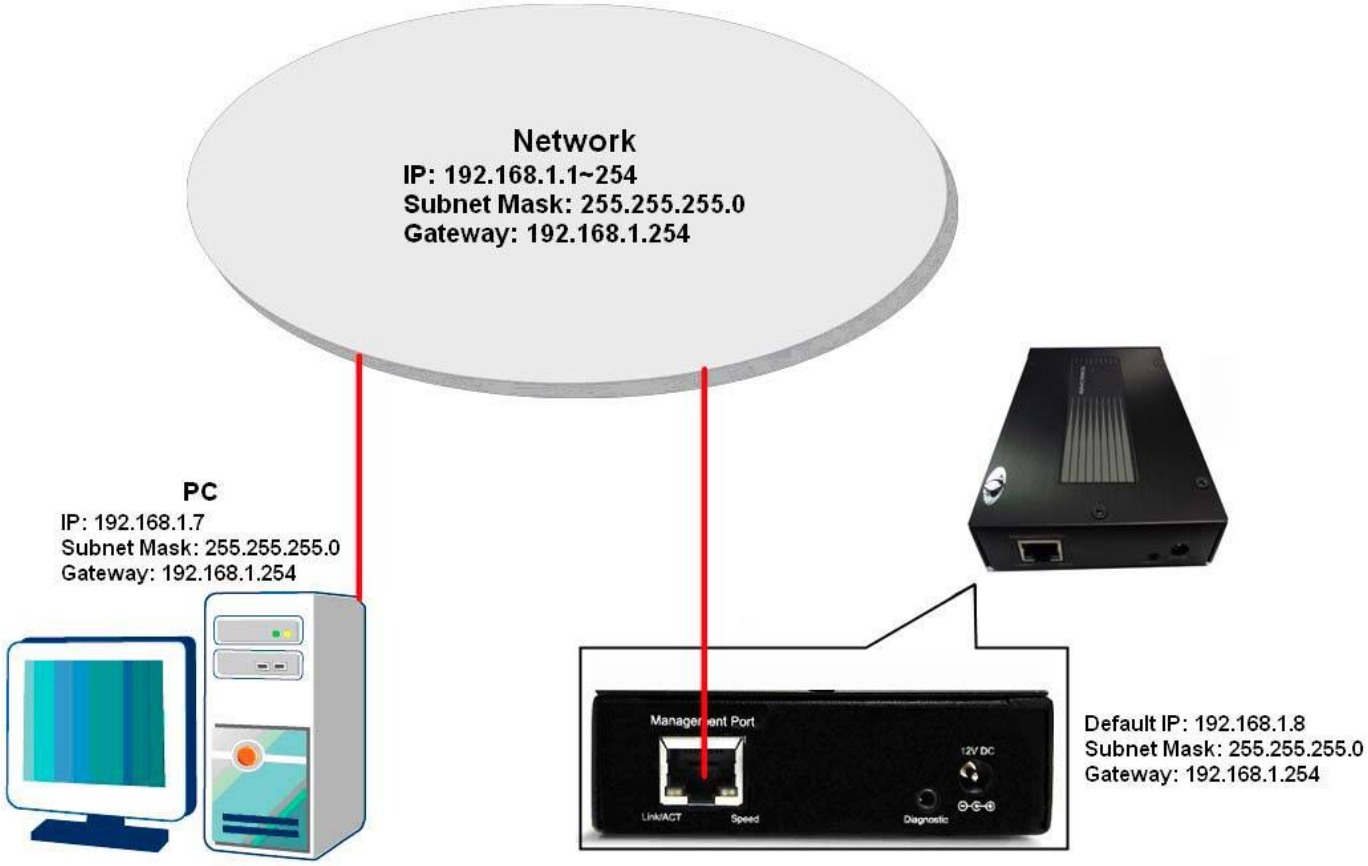
- Connecting CT-10G-MC series and PC to the same network via an RJ45 cable, and accessing CT-10G-MC series' settings/statistics with **PC's web browser**.
- Connecting CT-10G-MC series and PC via a 2.5mm Phone Jack to RS232 cable, and accessing CT-10G-MC series' settings/statistics with **HyperTerminal Softwares**.

Please see the sections down below for more information regarding to CT-10G-MC series management.

3.1. Managing CT-10G-MC series with Management Webpage

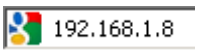
CT-10G-MC series is embedded with a management webpage, and can be accessed by connecting CT-10G-MC series' **Management Port** to the network which your PC is connected to via an RJ45 cable.

Before accessing to CT-10G-MC series'configuration webpage with your PC's web browser, please set the network according CT-10G-MC series'default IP Address (192.168.1.8). The figure down below is an example of network/PC settings for accessing CT-10G-MC series management webpage.



3.1.1. Accessing CT-10G-MC series Management Webpage

To access CT-10G-MC series' management webpage, please open your web browser, and type in CT-10G-MC series' default IP address (**192.168.1.8**) in web browser's URL field as shown in the figure on the right side. **If you've changed CT-10G-MC series' IP address, please input the IP address you've changed to instead.**



CT-10G-MC series' management webpage only supports Microsoft Internet Explorer ®, and CT-10G-MC series' management webpage might not display correctly if you're using other web browser.

A window will pop up after you entering CT-10G-MC series'IP address. Please enter the User Name and Password for CT-10G-MC series' configuration webpage.

Connect to 192.168.1.8
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name:
admin
Password:
Remember my password
OK
Cancel

- **Default User Name: admin**
- **Default Password: admin***

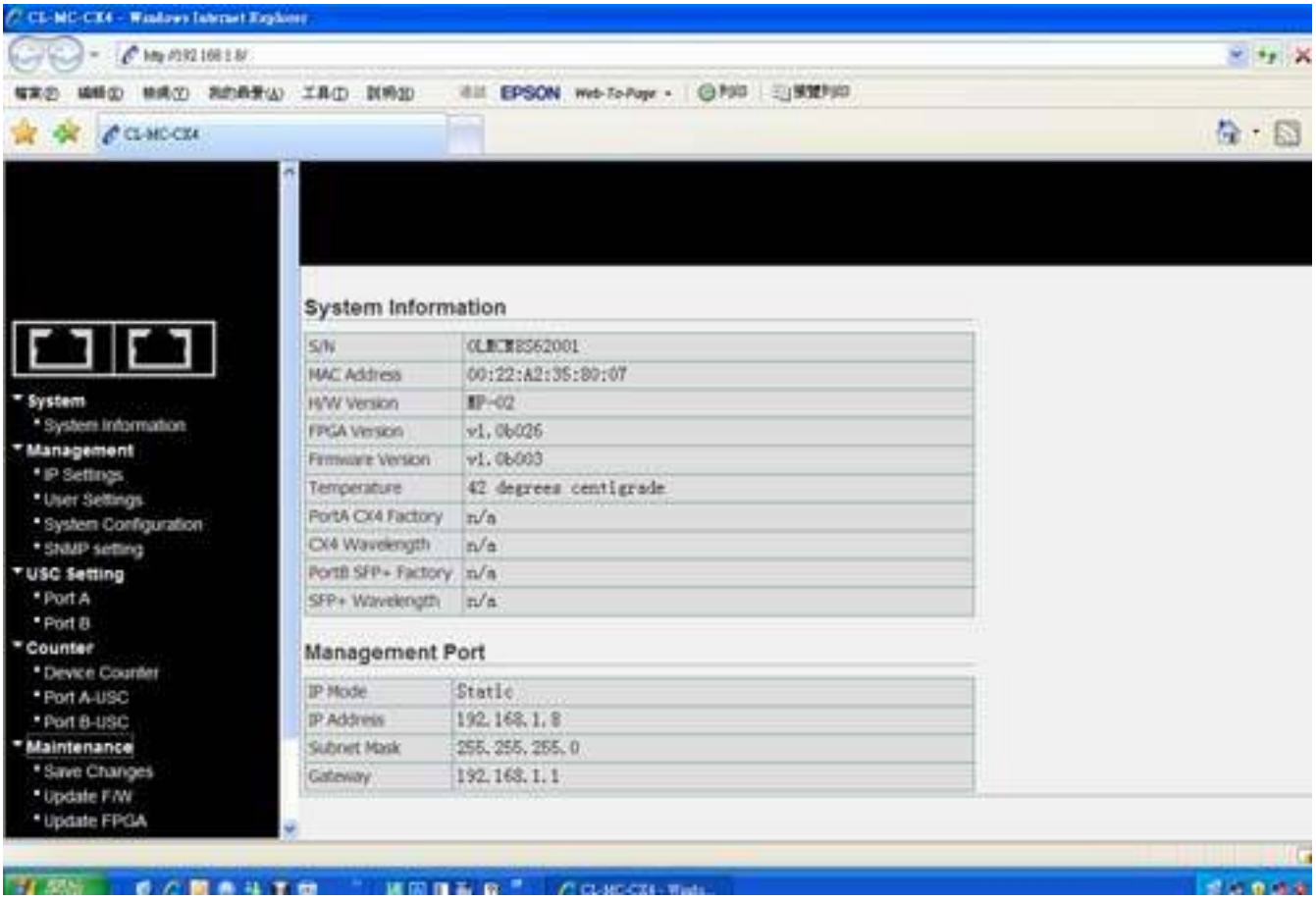
  ***Please note that the User Name and Password are case-sensitive.**

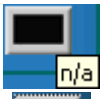
RE-BOOT if you have any modification than Default setting

For safety issues, it is highly recommended that you should change the User name and Password when logging to CT-10G-MC series' management webpage for the first time.

After inputting CT-10G-MC series management webpage's User Name and Password, you should be able to see CT-10G-MC series' management webpage displayed on your web browser as shown in the figure down below. The following sections will illustrate CT-10G-MC series management webpage functions with **CT-10G-MC-XFP2 series**. Management webpage for other CT-10G-MC series are quite the same and can be related.

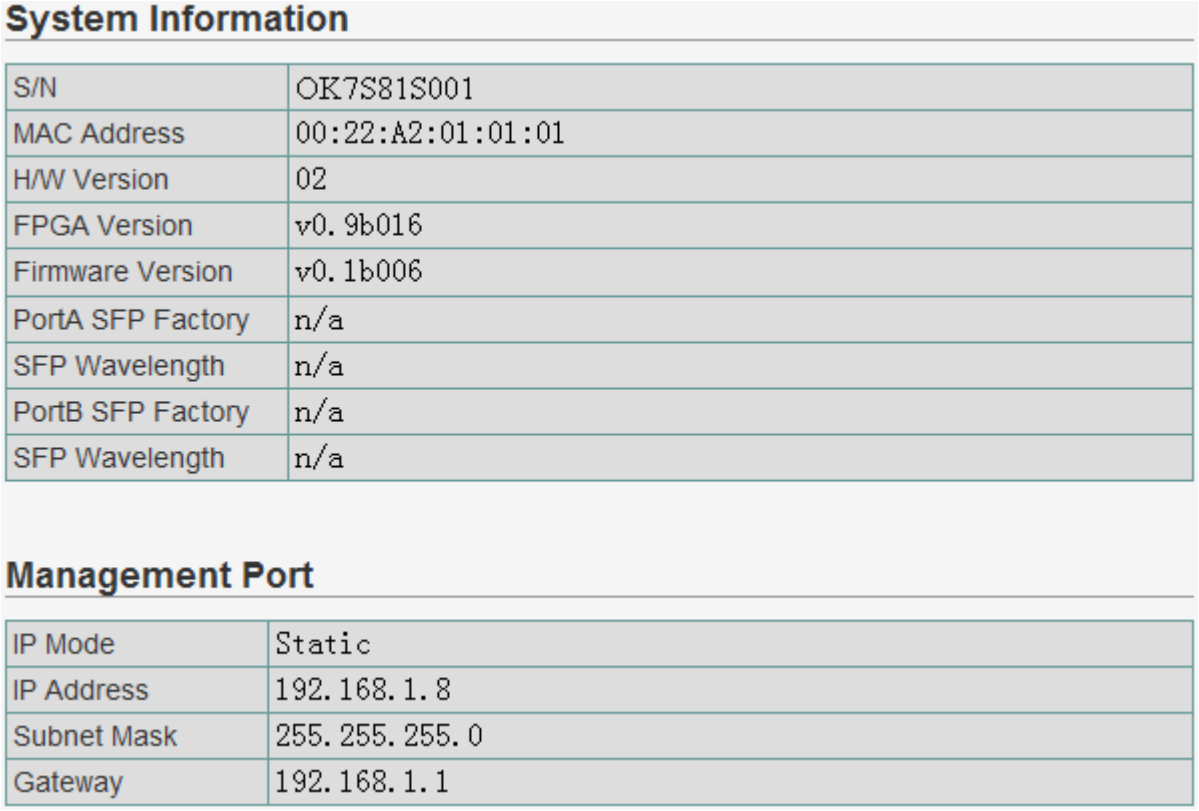
3.1.2. CT-10G-MC series Management Webpage – Overview



CT-10G-MC series Management Webpage Overview		
A	**Port Status**	This field displays the port status of your CT-10G-MC series. You can view the media type of a specific port by moving the mouse to it.  ➢ If CT-10G-MC series' port is not connected, the **Port** Status icon will show as the figure on the left. ➢ If CT-10G-MC series' port is connected, the **Port Status** icon will show as the figure on the left. Also, to view the counter report of a specific port, just click on the port.
B	**Setting Options**	The **Setting Options** contains options for CT-10G-MC series'ettings, information, and statistics, which can be divided into: • **System:** You can view system information here in this field. • **Management:** This option allows you to make settings such as CT-10G-MC series'IP address, SNMP, or user accounts. • **Counter:** You can view CT-10G-MC series' counter reports with this option. • **Maintenance:** This option allows you to save system settings, reboot CT-10G-MC series, and reset all CT-10G-MC series' settings to default value.
C	**Model Name**	This field displays the model name of your CT-10G-MC series.
D	**Main Display Screen**	The **Main Display Screen** displays the system information, network tapping statistics, and detail configuration options.

3.1.3. CT-10G-MC series Management Webpage – System

A. System Information



System Information

S/N	OK7S81S001
MAC Address	00:22:A2:01:01:01
H/W Version	02
FPGA Version	v0.9b016
Firmware Version	v0.1b006
PortA SFP Factory	n/a
SFP Wavelength	n/a
PortB SFP Factory	n/a
SFP Wavelength	n/a

Management Port

IP Mode	Static
IP Address	192.168.1.8
Subnet Mask	255.255.255.0
Gateway	192.168.1.1

System Information displays CT-10G-MC series' system information including:

System Information	
S/N	CT-10G-MC series' serial number.
MAC Address	CT-10G-MC series' MAC address.
FPGA Version	CT-10G-MC series' current FPGA (Field-Programmable Gate Array) version.
Firmware Version	CT-10G-MC series' current firmware version.
Port A SFP Factory	The manufacturer of the transceiver plugged in Port A.
Port B SFP Factory	The manufacturer of the transceiver plugged in Port B.
SFP Wavelength	The wavelength of Port A/B.
Management Port	
IP Mode	This field displays how CT-10G-MC series acquires its IP address. • **Static:** CT-10G-MC series' IP, subnet mask, and gateway addresses are assigned manually. • **DHCP:** CT-10G-MC series' IP, subnet mask, and gateway addresses are assigned automatically by a DHCP server.
IP Address	CT-10G-MC series' IP address.
Subnet Mask	CT-10G-MC series' subnet mask.
Gateway	CT-10G-MC series' gateway address.

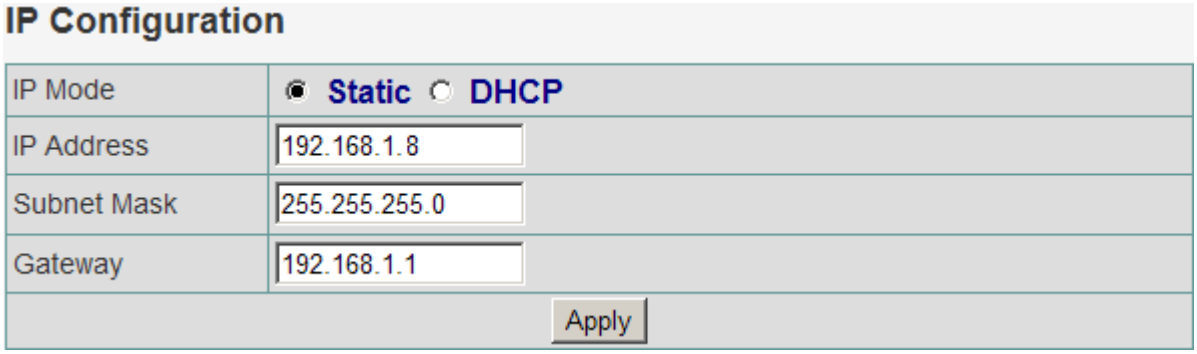
3.1.3. CT-10G-MC series Management Webpage – Management

There are 3 options available for **Management**, which includes:

- **IP Configuration:** Allows you to set how CT-10G-MC series will acquire its IP, subnet mask, and gateway addresses. Also, you could input these addresses manually here.
- **User Settings:** Allows you to change CT-10G-MC series configuration webpage User Name and Password.
- **System Configuration:** You can set **System Contact**, **System Location**, and **System Name** here.
- **SNMP Setting:** You can make SNMP (Simple Network Management Protocol) settings here.

Please see the sections for detail descriptions about settings available in **Management**:

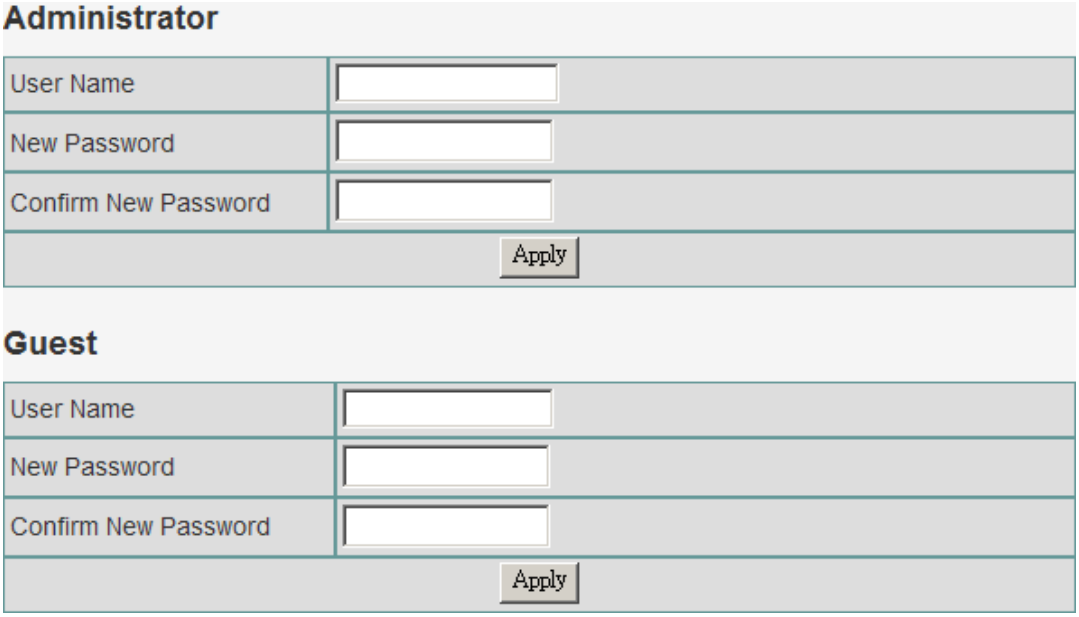
A. IP Configuration



IP Configuration	
IP Mode	You can choose how CT-10G-MC series acquires its IP, subnet mask, and gateway addresses. There are two modes available: • **Static:** You have to input CT-10G-MC series' IP, subnet mask, and gateway addresses manually in the fields down below. • **DHCP:** CT-10G-MC series acquires its IP, subnet mask, and gateway addresses automatically from network's DHCP server.
IP Address	You can input CT-10G-MC series' IP address here in this field.
Subnet Mask	You can input CT-10G-MC series' subnet mask here in this field.
Gateway	You can input CT-10G-MC series' gateway address here in this field.
Apply	Apply the changes you've made here.

＊Note: The default IP address for CT-10G-MC series is 192.168.1.8.

B. User Settings

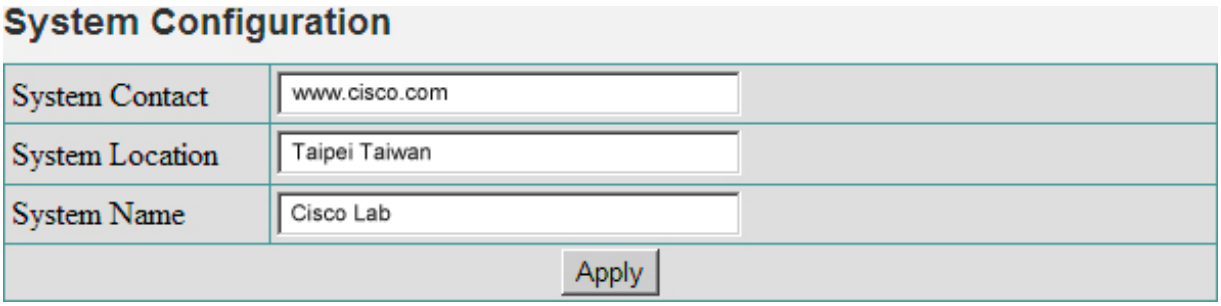


For issues regarding to system security, CT-10G-MC series has 2 different user security levels, which are:

- **Administrator:** User with **Administrator** privilege can change CT-10G-MC series system settings and view system information/statistics.
- **Guest:** User with **Guest** privilege can only view system information/statistics.

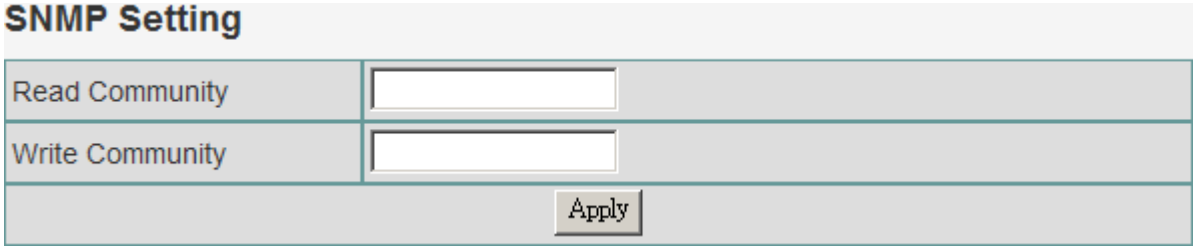
User Settings for Administrator/Guest	
User Name	Input the user name here in this field.
New Password	Input the password here in this field. Please note that **the password must contain at least 5 alphanumeric characters and is case sensitive**.
Confirm New Password	Please input the password here again for confirmation.
Apply	Apply the changes you've made here.

C. System Configuration



System Configuration	
System Contact	Input the contact information for CT-10G-MC series here in this field.
System Location	Input the system's location for CT-10G-MC series here in this field.
System Name	Input the alias for CT-10G-MC series here in this field.
Apply	Apply the changes you've made here.

D. SNMP Setting

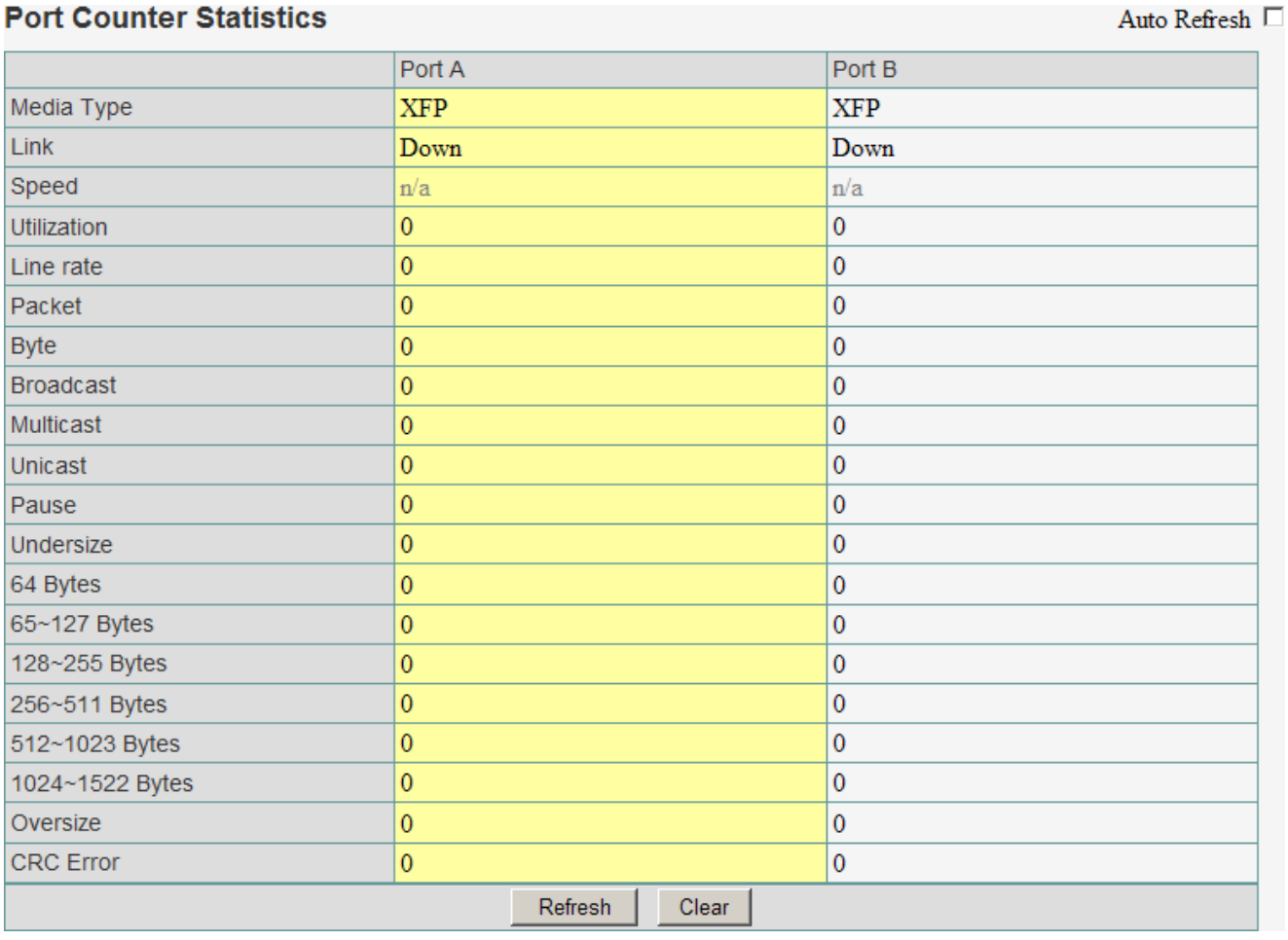


SNMP Setting	
Read Community	Input the user name that has only READ privilege.
Write Community	Input the user name that has both WRITE and READ privileges.
Apply	Apply the changes you've made here.

3.1.4. CT-10G-MC series Management Webpage – Counter

A. Device Counter

The **Counter Report** can display statistics reports of CT-10G-MC series' **Port A/B**.

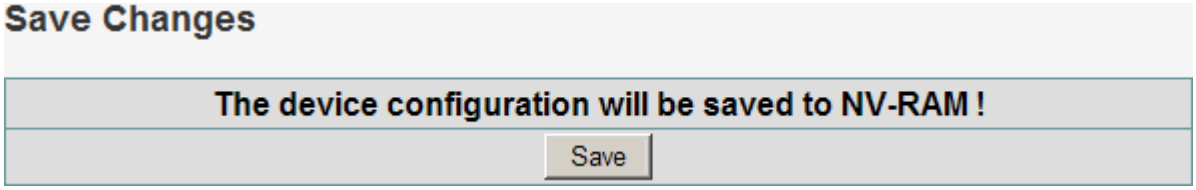


Device Counter	
Auto Refresh	Click the check box here allows the statistics table to refresh automatically.
Refresh	Refresh the configuration webpage and update the latest statistics.
Clear	Clear all statistics displayed in the table.

3.1.5. CT-10G-MC series Management Webpage – Maintenance

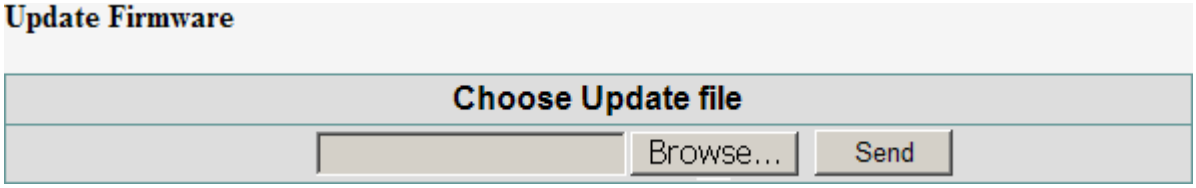
Four options are available in the **Maintenance** configuration webpage: **Save Changes**, **System Reboot**, **Factory Defaults**, and **Logout**.

A. Save Changes



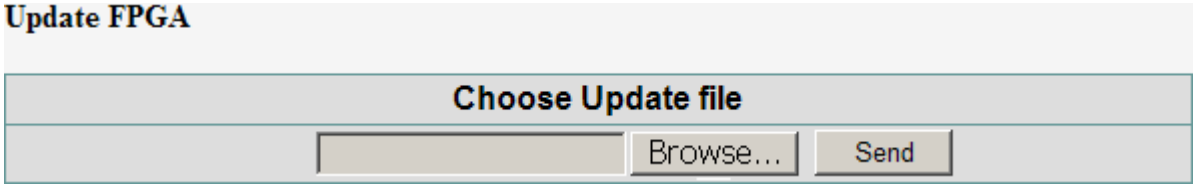
Save Changes	
Save	If you don't save the setting you've made via CT-10G-MC series' configuration webpage, all settings will be erased after rebooting CT-10G-MC series. Please click the "**Save**" button to save the settings to CT-10G-MC series' NV-RAM.

B. Update F/W (Firmware)



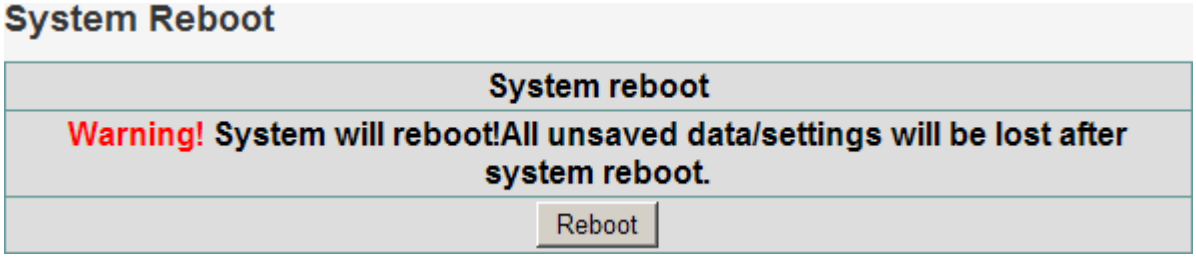
Update F/W (Firmware)	
Browse…	Click the **Browse…** button to choose the firmware file you would like to upgrade. CT-10G-MC series' firmware files are in the format of "***.bin**".
Send	Click this button to start upgrading CT-10G-MC series' firmware.

C Update FPGA



Update FPGA	
Browse…	Click the **Browse…** button to choose the FPGA file you would like to upgrade. CT-10G-MC series' FPGA files are in the format of "***.bin**".
Send	Click this button to start upgrading CT-10G-MC series' FPGA.

D. System Reboot

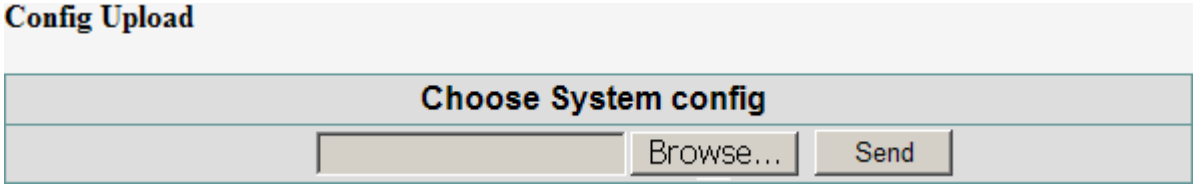

System Reboot
System reboot
Warning! System will reboot!All unsaved data/settings will be lost after system reboot.
Reboot

System Reboot	
Reboot	You can reboot CT-10G-MC series by clicking the "**Reboot**" button. Please note that all unsaved settings will be lost after system reboot.

E. System Config

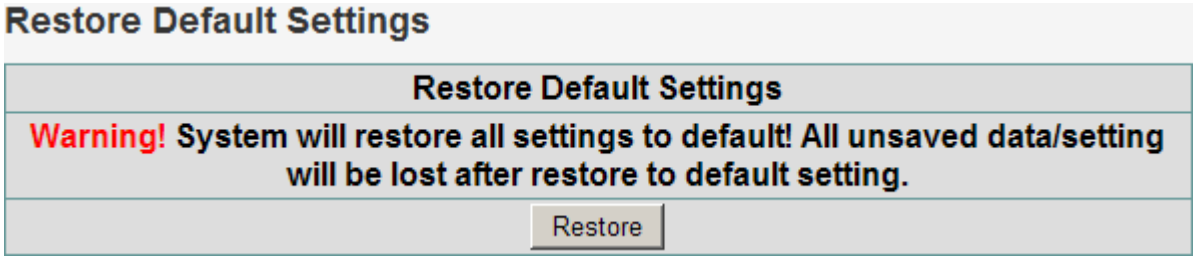
System Config	
System Config	Click **System Config** to save all CT-10G-MC series' current settings into a **"*.cfg"** file. You can upload this config file to CT-10G-MC series with **Config** Upload function.

F. Config Upload



Config Upload	
Browse…	Click the **Browse…** button to choose the config file you would like to upload to CT-10G-MC series. CT-10G-MC series' config files are in the format of "***.cfg**".
Send	Click this button to start uploading CT-10G-MC series' config file.

G. Factory Defaults


Restore Default Settings
Restore Default Settings
Warning! System will restore all settings to default! All unsaved data/setting will be lost after restore to default setting.
Restore

Factory Defaults	
Restore	You can set all CT-10G-MC series' settings to the default value by clicking the "**Restore**" button. Please note that all unsaved data/settings will be lost after restoring CT-10G-MC series' settings to default value.

3.2. Managing CT-10G-MC series with HyperTerminal

CT-10G-MC series allows users to make system configurations and view test statistics/system information with **HyperTerminal**. To access CT-10G-MC series via **HyperTerminal**, you have to connect CT-10G-MC series' **Diagnostic Port** with **PC's RS-232 Port** via a 2.5mm Phone Jack to RS-232 cable as shown in the figure above.

The following sections will be using **CT-10G-MC-XFP2 series** as an example. Settings, installations, and HyperTerminal commands for other CT-10G-MC series are quite the same and can be related.

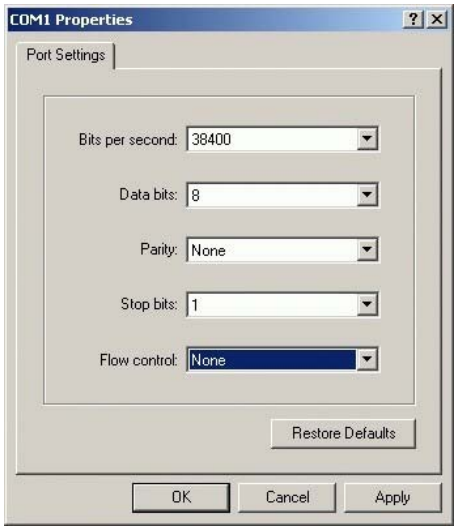
3.3.1. HyperTerminal Settings for CT-10G-MC series

After connecting the **PC's serial port** to CT-10G-MC series' **Console Port** via a **2.5mm Phone Jack to RS-232 cable**, please start the **HyperTerminal** software installed on your PC and establish connection according to the steps listed down below.

Establishing Connection with CT-10G-MC series

1. Input a name for this connection, such as CT-10G-MC series, and also select an icon for this connection. Click "**OK**" to continue.

2. Select the COM port of PC for this connection. Click "**OK**" to continue.

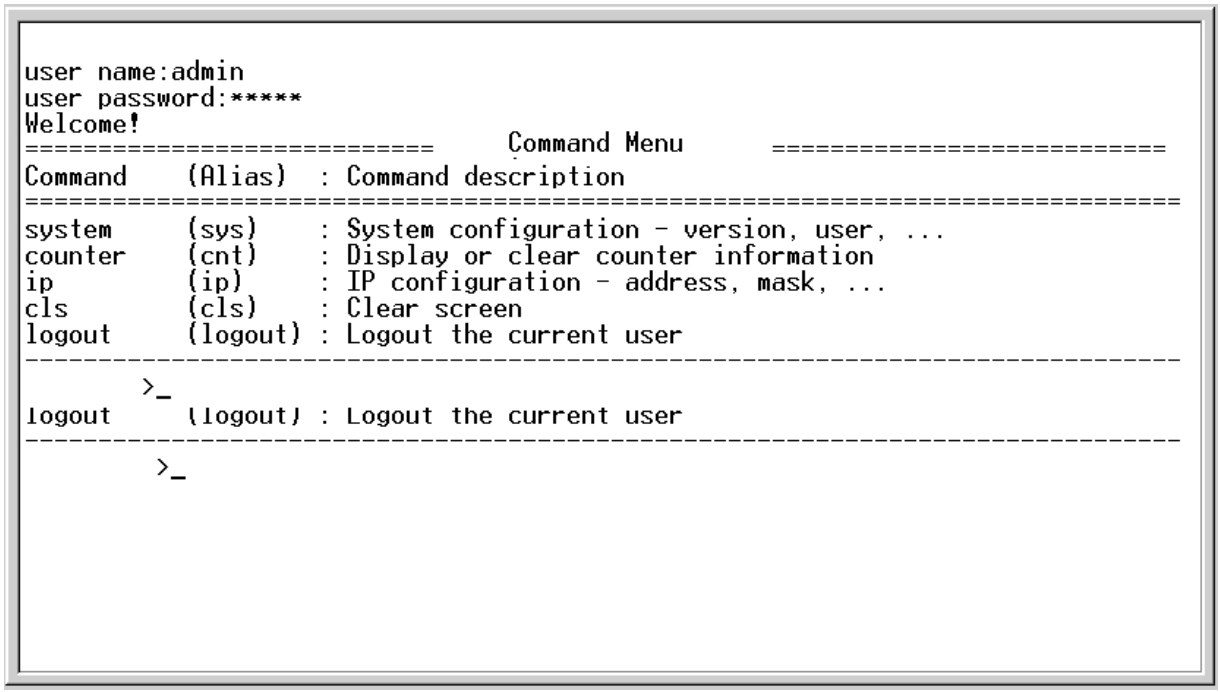


3. Set the COM port parameters according to the settings listed down below:

- **Bits per second:** 38400
- **Data bits:** 8
- **Parity:** None
- **Stop bits:** 1
- **Flow control:** None

Click "**OK**" to continue.

Establishing Connection with CT-10G-MC series

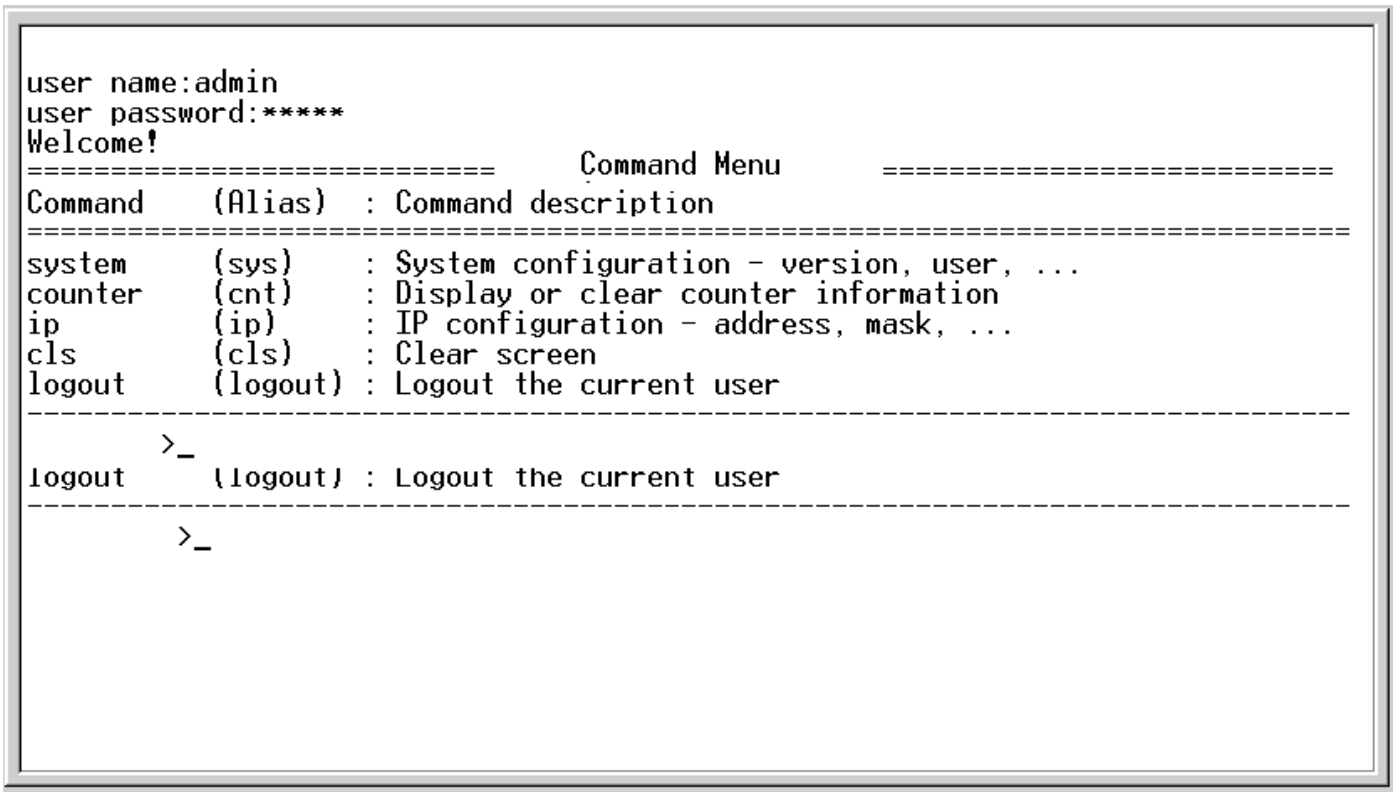

user name:admin
user password:*****
Welcome!
Command Menu
Command (Alias) : Command description
system (sys) : System configuration - version, user, ...
counter (cnt) : Display or clear counter information
ip (ip) : IP configuration - address, mask, ...
cls (cls) : Clear screen
logout (logout) : Logout the current user
>_
logout (logout) : Logout the current user
>_

Click the "**Enter**" key on your keyboard to start setting CT-10G-MC series via HyperTerminal. To log in please type CT-10G-MC series' user name and password:

- **Default User Name: admin**
- **Default Password: admin (Both the User Name and Password are case-sensitive.)**

If you change CT-10G-MC series' user name and password with CT-10G-MC series' configuration webpage, please log in with the new user name and password here.

3.3.2. CT-10G-MC series HyperTerminal Commands


user name:admin
user password:*****
Welcome!
Command Menu
Command (Alias) : Command description
system (sys) : System configuration - version, user, ...
counter (cnt) : Display or clear counter information
ip (ip) : IP configuration - address, mask, ...
cls (cls) : Clear screen
logout (logout) : Logout the current user
>_
logout (logout) : Logout the current user
>_

After logging in CT-10G-MC series via HyperTerminal, a **CT-10G-MC series Command Menu** will be displayed, showing CT-10G-MC series' HyperTerminal commands. Please see the table down below for brief descriptions of CT-10G-MC series commands:

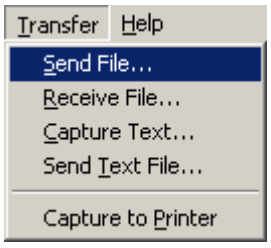
Command	Alias	Command Description
system	**sys**	The **system** command allows you to view CT-10G-MC series' system information, make system configurations, and upgrade CT-10G-MC series' firmware/FPGA.
counter	**cnt**	The **counter** command allows you to view CT-10G-MC series' counter information.
ip	**ip**	The **ip** command allows you to view CT-10G-MC series' current IP settings or configure these settings.
cls	**cls**	The **cls** command allows you to clear HyperTerminal screen.
logout	**logout**	The **logout** command allows you to log out. For security issues, it is recommended that you should log out if you're not using the HyperTerminal anymore.

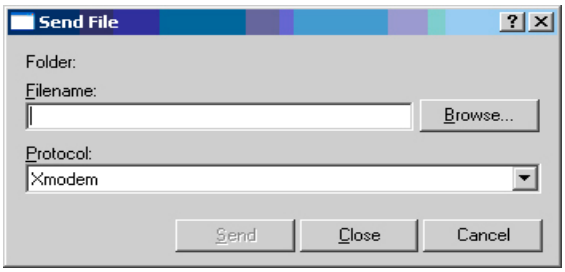
Please see sections down below for more detailed information regarding to CT-10G-MC series' command.

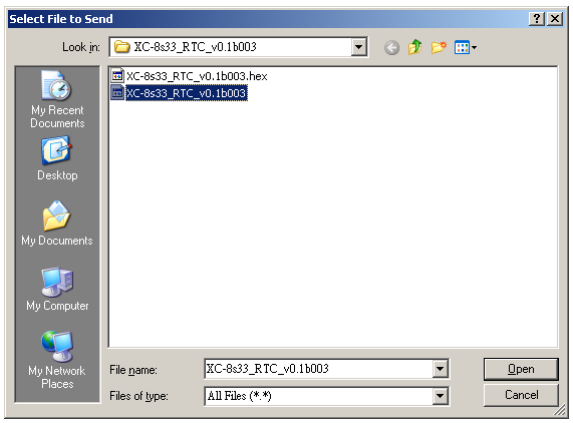
A. CT-10G-MC series HyperTerminal Command – system

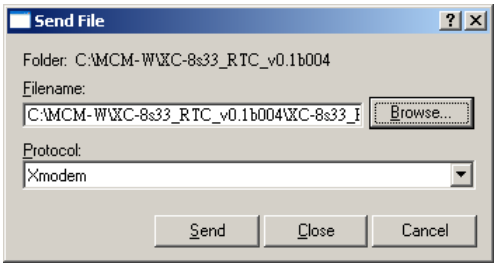
<table>
<tr><th colspan="4">Command Descriptions – system</th></tr>
<tr><td rowspan="12">system</td><td>show</td><td colspan="2">The system show allows you to view CT-10G-MC series' PCB/firmware/FPGA versions, as well as hardware temperature.</td></tr>
<tr><td rowspan="3">user</td><td>show</td><td>The system user show command allows you to view the current users and their passwords.</td></tr>
<tr><td>admin</td><td>The system user admin [name | password] <name | password> command allows you to change the user name and its password of the user with administrator privilege. For example, if you type in system user admin name test123 and press enter, a user named test123 with administrator privilege will be created.</td></tr>
<tr><td>guest</td><td>The system user guest [name | password] <name | password> command allows you to change the user name and its password of the user with guest privilege. For example, if you type in system user guest name test123 and press enter, a user named test123 with guest privilege will be created.</td></tr>
<tr><td rowspan="2">devname</td><td>show</td><td>The system devname show command allows you to view the device name assigned to CT-10G-MC series.</td></tr>
<tr><td>set</td><td>The system devname set [device name] command allows you to view the device name assigned to CT-10G-MC series.</td></tr>
<tr><td rowspan="3">snmp</td><td>show</td><td>The system snmp show command will show the current SNMP (Simple Network Management Protocol) settings.</td></tr>
<tr><td>writecommunity</td><td>The system snmp writecommunity <parameter> allows you to set the community with write privilege. The <parameter> can be public, private, or user names.</td></tr>
<tr><td>readcommunity</td><td>The system snmp readcommunity <parameter> allows you to set the community with read privilege. The <parameter> can be public, private, or user names.</td></tr>
<tr><td>save</td><td colspan="2">The system save command allows you to save the current settings to CT-10G-MC series' NV-RAM. Please note that all unsaved settings will be lost after system reboot.</td></tr>
<tr><td>update</td><td>firmware/FPGA</td><td>The system update [firmware/FPGA] commands allow you to upgrade CT-10G-MC series' firmware/FPGA. The following descriptions are for upgrading CT-10G-MC series' firmware. However, proced ures for upgrading CT-10G-MC series' FPGA are quite the same and can be related.

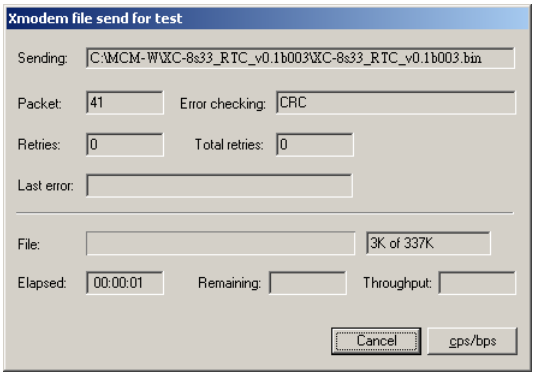
1. Type in "system update firmware" and click enter. Press Y to proceed and start upgrading firmware, or press N to cancel.

2. Press Transfer on HyperTerminal's menu bar and choose "Send File".
 
</td></tr>
</table>

<table>
<tr><th colspan="4">Command Descriptions – system</th></tr>
<tr><td rowspan="4">system (Contd.)</td><td rowspan="3">update (Contd.)</td><td rowspan="3">firmware/FPGA (Contd.)</td><td>3. A Send File window will pop up. Please set the Protocol to Xmodem, and click the Browse button.
 

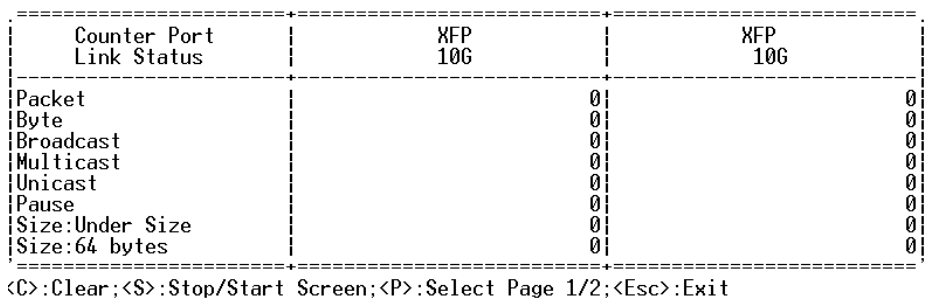
4. Choose the firmware you would like to upgrade to and click Open.
 

5. Click the Send button to start sending firmware.
 

6. System is sending firmware to CT-10G-MC series.
 

7. CT-10G-MC series will reboot when finishing upgrading its firmware.</td></tr>
<tr><td>reset</td><td>The system reset command allows you to reset all CT-10G-MC series settings back to the default values.</td></tr>
<tr><td>reboot</td><td>The system reboot command allows you to reboot CT-10G-MC series. Please note that all unsaved settings will be lost after rebooting.</td></tr>
</table>

B. CT-10G-MC series HyperTerminal Command – counter

<table>
<tr><th colspan="4">Command Descriptions – counter</th></tr>
<tr><td rowspan="5">counter</td><td>show</td><td colspan="2">The counter show command allows you to view all CT-10G-MC series' counter report.
 

➢ C: Press C to clear all counters.
➢ S: Press S to stop/start refreshing counters.
➢ P: Press P to switch pages. CT-10G-MC series' counter report has 2 pages.
➢ Esc: Press the Esc key to exit CT-10G-MC series' counter report.</td></tr>
<tr><td rowspan="3">clear</td><td>0</td><td>Clear all counter reports of CT-10G-MC series' Port A.</td></tr>
<tr><td>1</td><td>Clear all counter reports of CT-10G-MC series' Port B.</td></tr>
<tr><td>all</td><td>Clear all counter reports of CT-10G-MC series' Port A and Port B.</td></tr>
<tr><td rowspan="2">refreshtime</td><td>show</td><td>The refreshtime show command allows you to view the refresh time for the report.</td></tr>
<tr><td>set</td><td>The refreshtime set command allows you to set the refresh time (in seconds) for the report.</td></tr>
</table>

C. CT-10G-MC series HyperTerminal Command – ip

<table>
<tr><th colspan="4">Command Descriptions – ip</th></tr>
<tr><td rowspan="6">ip</td><td>show</td><td colspan="2">The ip show command allows you to view information of CT-10G-MC series' IP configuration.</td></tr>
<tr><td>status</td><td colspan="2">The ip status command allows you to view information of CT-10G-MC series' IP status.</td></tr>
<tr><td rowspan="2">mode</td><td>dhcp</td><td>The ip mode dhcp command allows you to set CT-10G-MC series' IP acquiring mode to DHCP, allowing CT-10G-MC series to acquire IP automatically from DHCP server.</td></tr>
<tr><td>static</td><td>The ip mode static command allows you to set CT-10G-MC series' IP acquiring mode to Static, allowing you to set IP/Subnet Mask/Gateway IP manually.</td></tr>
<tr><td>address*</td><td colspan="2">The ip address <IP Address> command allows you to set CT-10G-MC series' IP address. For example, to set CT-10G-MC series' IP address to 192.168.1.20, please input the command "ip address 192.168.1.20".</td></tr>
<tr><td>mask*</td><td colspan="2">The ip mask <Subnet Mask Address> command allows you to set CT-10G-MC series' subnet mask address. For example, to set CT-10G-MC series' subnet mask address to 255.255.255.0, please input the command "ip mask 255.255.255.0".</td></tr>
<tr><td>gateway*</td><td colspan="2">The ip gateway <Gateway Address> command allows you to set CT-10G-MC series' gateway address. For example, to set CT-10G-MC series' subnet gateway address to 192.168.1.254, please input the command "ip gateway 192.168.1.254".</td></tr>
</table>

***CT-10G-MC series' default IP address/subnet mask/default gateway are 192.168.1.8/255.255.255.0/192.168.1.1**

D. CT-10G-MC series HyperTerminal Command – cls

Command Descriptions – cls	
cls	The **cls** command allows you to clear HyperTerminal screen.

E. CT-10G-MC series HyperTerminal Command – logout

Command Descriptions – logout	
logout	The **logout** command allows you to log out of CT-10G-MC series' HyperTerminal configuration session.

4. CT-10G-MC series General Specifications

System Control		
System Control	➢ **Transceiver Power ON/OFF** ➢ **Selectable Auto/Force Media Type**	➢ **Link Connection Mode:** Slave/Segment ➢ **System Upgrade (F/W, FPGA)**
Device Status Report		
Status Report	➢ **Information** ➢ **Link Status** ➢ **Temperature Detection**	➢ **Module Detection** ➢ **Fiber Module Detection** ➢ **Transceiver overloading**
MIB Counter Report *		
Counter Report	➢ **Packet** ➢ **Broadcast packet** ➢ **Length: 64 Bytes** ➢ **Length: 128-255 Bytes** ➢ **Length: 512-1023 Bytes** ➢ **Unicast packet** ➢ **CRC Error** ➢ **Under size packet**	➢ **Byte** ➢ **Pause Frame** ➢ **Length: 65-127 Bytes** ➢ **Length: 256-511 Bytes** ➢ **Length: 1024-1518 Bytes** ➢ **Multicast packet** ➢ **IP Checksum Error *** ➢ **Over size packet**
Hardware		
Temperature	➢ Operating: 0°C ~ 40°C (32°F ~ 104°F)	➢ Storage: 0°C ~ 50°C (32°F ~ 122°F)
Humidity (non-condensing)	➢ Operating: 0% ~ 85% RH	➢ Storage: 0% ~ 85% RH
Dimension	147 mm x 89 mm x 28 mm	